

REMARKS/ARGUMENTS:

Claims 1-3 are amended. Support for the amendment to claim 1 can be found at p. 37, line 22-p. 38, line 13 and p. 38, line 23-p. 39, line 6 of Applicant's specification. Claims 1-37 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present invention relates to a multi-layer piezoelectric element and an injection apparatus, for example, fuel injection apparatus of automobile engine, liquid injection apparatus of ink jet printer or the like, or a drive unit used in precision positioning device or vibration preventing device for an optical apparatus, and to a multi-layer piezoelectric element used as a sensor element mounted in combustion pressure sensor, knocking sensor, acceleration sensor, load sensor, ultrasound sensor, pressure sensor, yaw rate sensor or the like, or used as a circuit component mounted in piezoelectric gyro, piezoelectric switch, piezoelectric transducer, piezoelectric breaker or the like. (Applicant's specification, at p. 1, lines 7-19).

CLAIM REJECTIONS UNDER 35 U.S.C. § 112:

Claims 1-3 and 19-22 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses this rejection as to amended claims 1-3 and 19-22.

The Office states,

"These claims define the invention entirely on the goals of the structure without citing how these goals are achieved. No materials

are cited to assure the bonding strength and bending strength relationships. No materials or compositions are cited to assure the desired ratio range of thermal expansion or the inequality defining the relationships between thermal expansions of the components."

In response, Applicant clarified claim 1 by deleting the limitation "wherein a bonding strength between the piezoelectric layer and the internal electrode is controlled to be weaker than a bending strength of the piezoelectric layer"; and adding the limitation "a glass layer which is formed between said at least one piezoelectric layer and said a plurality of internal electrodes." Withdrawal of this rejection is thus respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102:

Claims 1-3, 19, 20, 22, 25, 26, 28, 29, and 32-36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kawamoto (JP 2003-318458).

CLAIM REJECTIONS UNDER 35 U.S.C. § 103:

Claims 21, 24, 27, 30, and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawamoto (JP 2003-318458).

Applicant respectfully traverses the above rejections as to amended claims 1-3, 19-22, and 24-36. Claim 1, as amended, is as follows:

A multi-layer piezoelectric element comprising:
a stack formed by stacking at least one piezoelectric layer and a plurality of internal electrodes consisting of first and second internal electrodes alternately one on another;
a first external electrode which is formed on a first side face of the stack and is connected to the first internal electrode;

a second external electrode which is formed on a second side face of the stack and is connected to the second internal electrode, and
a glass layer which is formed between said at least one piezoelectric layer and said a plurality of internal electrodes.

Applicant respectfully submits that Kawamoto cannot anticipate or render claim 1 obvious, because Kawamoto fails to teach or suggest "a glass layer which is formed between said at least one piezoelectric layer and said a plurality of internal electrodes."

In Kawamoto, the piezoelectric layer and the internal electrode are bonded by an anchor effect (See e.g., paragraph [0009] machine translation of Kawamoto). In contrast, in the present invention, the piezoelectric layer and the internal electrode are bonded with a glass layer.

In light of the foregoing, Applicant respectfully submits that Kawamoto cannot anticipate or render claim 1 obvious, because Kawamoto fails to teach or suggest each and every claim limitation. Claims 2, 3, 19-22, and 24-36 depend from claim 1 and cannot be anticipated or rendered obvious for at least the same reasons as claim 1. Withdrawal of these rejections is thus respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4600 to discuss the steps necessary for placing the application in condition for allowance.

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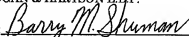
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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON LLP.

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By:



Barry M. Shuman
Registration No. 50,220

1999 Avenue of the Stars, Suite 1400
Los Angeles, California 90067
Phone: 310-785-4600
Fax: 310-785-4601